WHAT IS CLAIMED IS:

1. A DSL line interface unit for transmitting a DSL transmit signal to a transmission line and for receiving a DSL receive signal from the transmission line, the DSL line interface unit comprising:

a differential line driver including a first amplifier and a second amplifier for amplifying the DSL transmit signal;

a first complex termination module coupled to an output of the first amplifier;

a second complex termination module coupled to an output of the second amplifier;

a transformer including a primary winding coupled to the transmission line and a secondary winding coupled to the first complex termination module and to the second complex termination module; and

an impedance synthesizer module coupled to the secondary winding of the transformer and providing negative feedback to the first amplifier and the second amplifier.

2. The DSL line interface unit of claim 1, wherein the first amplifier includes a first positive input terminal and a first negative input terminal and the second amplifier includes a second positive input terminal and a second negative input terminal, and the impedance synthesizer module is coupled to the first negative input terminal and the second negative input terminal to provide the negative feedback.

3. The DSL line interface unit of claim 2, wherein the differential line driver further includes:

a first resistor coupled between the output of the first amplifier and the first negative input terminal; and

a second resistor coupled between the output of the second amplifier and the second negative input terminal.

4. The DSL line interface unit of claim 2, wherein both the first amplifier and the second amplifier are operational amplifiers.

5. The DSL line interface unit of claim 1, wherein:

the first complex termination module includes a first resistor and a first capacitor coupled to the first resistor in parallel; and

the second complex termination module includes a second resistor and a second capacitor coupled to the second resistor in parallel.

6. The DSL line interface unit of claim 1, wherein:

the first complex termination module includes a first inductor and a first capacitor coupled to the first inductor in parallel; and

the second complex termination module includes a second inductor and a second capacitor coupled to the second inductor in parallel.

7. The DSL line interface unit of claim 1, wherein the impedance synthesizer module includes:

a first resistor coupled between center taps of the secondary winding of the transformer and having a first end and a second end;

a second resistor coupled between the first end of the first resistor and a negative input of the first amplifier; and

a third resistor coupled between the second end of the first resistor and a negative input of the second amplifier.

8. A DSL line interface unit for transmitting a DSL transmit signal to a transmission line and for receiving a DSL receive signal from the transmission line, the DSL line interface unit comprising:

a differential line driver including a first amplifier, a second amplifier, a first resistor, and a second a resistor, the first amplifier including a first positive input terminal and a first negative input terminal and the second amplifier including a second positive input terminal and a second negative input terminal, the first resistor coupled between an output of the first amplifier and the first negative input terminal and the second resistor coupled between an output of the second amplifier and the second negative input terminal;

a first complex termination module including a third resistor and a first capacitor coupled to the third resistor in parallel, the third resistor and the first capacitor being coupled to the output of the first amplifier;

a second complex termination module including a fourth resistor and a second capacitor coupled to the fourth resistor in parallel, the

fourth resistor and the second capacitor coupled to the output of the second amplifier;

a transformer including a primary winding coupled to the transmission line and a secondary winding having a first winding end coupled to the third resistor and the first capacitor and a second winding end coupled to the fourth resistor and the second capacitor; and

an impedance synthesizer module including a fifth resistor, a sixth resistor, and a seventh resistor, the fifth resistor being coupled between center taps of the secondary winding of the transformer and having a first end and a second end, the sixth resistor coupled between the first end of the fifth resistor and the first negative input terminal of the first amplifier, and the seventh resistor coupled between the second end of the fifth resistor and the second negative input terminal of the second amplifier, the fifth resistor detecting a voltage between the center taps of the secondary winding of the transformer and providing negative feedback to the first amplifier and the second amplifier via the sixth resistor and the seventh resistor, respectively.

9. A DSL line interface unit for transmitting a DSL transmit signal to a transmission line and for receiving a DSL receive signal from the transmission line, the DSL line interface unit comprising:

a differential line driver including a first amplifier and a second amplifier for amplifying the DSL transmit signal;

a first complex termination module coupled to an output of the first amplifier;

a second complex termination module coupled to an output of the second amplifier;

a transformer including a primary winding coupled to the transmission line and a secondary winding coupled to the first complex termination module and the second complex termination module; and

an impedance synthesizer module including a first resistor, a second resistor, and a third resistor, the first resistor being coupled between center taps of the secondary winding of the transformer and having a first end and a second end, the second resistor coupled between the first end of the first resistor and a negative input terminal of the first amplifier, and the second resistor coupled between the second end of the first resistor and a negative input terminal of the second amplifier, the first resistor detecting a voltage between the center taps of the secondary winding of the transformer and providing negative feedback to the first amplifier and the second amplifier via the second resistor and the third resistor, respectively.

10. A DSL line interface for transmitting a DSL transmit signal to a transmission line and for receiving a DSL receive signal from the transmission line, the DSL line interface comprising:

amplification means for amplifying the DSL transmit signal;

detection means coupled to the amplification means for detecting a voltage corresponding to the DSL receive signal;

isolation means coupled between the detection means and the transmission line for electrically isolating the amplification means and the detection means from the transmission line; and

feedback means coupled between the amplification means and the isolation means for providing negative feedback to the first amplifier and the second amplifier.

11. The DSL line interface of claim 10, wherein the feedback means detects current flowing through the isolation means and provides a feedback signal corresponding to the detected current to the amplification means to provide the negative feedback.

12. The DSL line interface of claim 10, wherein the detection means includes at least a resistor means and a capacitor means coupled to the resistor means in parallel.

13. The DSL line interface of claim 10, wherein the amplification means differentially amplifies the DSL transmit signal.